

Application Number 10/620,896
Amendment in Response to Office Action mailed June 17, 2005

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended): A power amplifier module comprising:

- a first amplifier to amplify a voice call for transmission over a first output branch;
- a second amplifier to amplify a data call for transmission over a second output branch;
- a phase shifter to generate a phase-shifted version of the voice call; and

at least one a switch to decouple the data call from the second amplifier and couple the phase-shifted version of the voice call to the second amplifier when required transmit power for the voice call exceeds a the threshold.

Claim 2 (Original): The power amplifier module of claim 1, further comprising a coupler circuit to combine the first and second output branches for transmission over a wireless interface associated with a mobile wireless communication device.

Claim 3 (Original): The power amplifier module of claim 2, wherein the coupler circuit includes a 90-degree hybrid coupler that combines the first and second output branches.

Claim 4 (Original): The power amplifier module of claim 1, further comprising a power control unit to control the phase shifter and the switch based on required transmit power for the voice call.

Claim 5 (Original): The power amplifier module of claim 4, wherein the power control unit monitors power control data, and controls the phase shifter and the switch in response to the power control data.

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Claim 6 (Original): The power amplifier module of claim 4, wherein the power control unit controls the switch to couple the data call to the second amplifier and decouple the voice call from the second amplifier when the required transmit power is less than the threshold.

Claim 7 (Original): The power amplifier module of claim 1, wherein the voice call and the phase-shifted voice call are substantially identical except for the phase shift.

Claim 8 (Original): The power amplifier module of claim 1, wherein the phase shifter phase-shifts the voice call approximately 90 degrees.

Claim 9 (Original): A power amplifier module comprising:

- a first amplifier to amplify a voice call for transmission over a first output branch;
- a second amplifier to amplify a data call for transmission over a second output branch;
- a coupler circuit to combine the first and second output branches for transmission over a wireless interface associated with a mobile wireless communication device; and
- means for coupling a phase-shifted version of the voice call to the second amplifier when required transmit power for the voice call exceeds a threshold.

Claim 10 (Original): The power amplifier module of claim 9, wherein the coupler circuit includes a 90-degree hybrid coupler that combines the first and second output branches.

Claim 11 (Currently Amended): The power amplifier module of claim 9, wherein the coupling means includes at least one a switch to decouple the data call from the second amplifier and couple the phase-shifted version of the voice call to the second amplifier when required transmit power for the voice call exceeds the threshold.

Claim 12 (Original): The power amplifier module of claim 9, further comprising a phase shifter to generate the phase-shifted version of the voice call when required transmit power for the voice call exceeds the threshold.

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Claim 13 (Original): The power amplifier module of claim 12, wherein the phase shifter phase-shifts the voice call approximately 90 degrees.

Claim 14 (Original): The power amplifier module of claim 9, further comprising a power control unit to control the coupling means based on the required transmit power for the voice call.

Claim 15 (Original): The power amplifier module of claim 14, wherein the power control unit monitors power control data, and controls the coupling means in response to the power control data.

Claim 16 (Original): The power amplifier module of claim 9, wherein the power control unit controls the coupling means to couple the data call to the second amplifier and decouple the voice call from the second amplifier when the required transmit power is less than the threshold.

Claim 17 (Original): The power amplifier module of claim 9, wherein the voice call and the phase-shifted voice call are substantially identical except for the phase shift.

Claim 18 (Currently Amended): A power amplifier/antenna module comprising:
a first amplifier to amplify a voice call for transmission over a first output branch;
a second amplifier to amplify a data call for transmission over a second output branch;
a radio frequency antenna for a wireless interface associated with a mobile wireless communication device; and
a coupler circuit to combine the first and second output branches for transmission over the antenna; and
a switch that couples a phase-shifted version of the voice call to the second amplifier when required transmit power for the voice call exceeds a threshold.

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Claim 19 (Currently Amended): The power amplifier/antenna module of claim 18, further comprising:

a phase shifter to generate ~~the~~ a phase-shifted version of the voice call when required transmit power for the voice call exceeds ~~the~~ a threshold; and

a switch to decouple the data call from the second amplifier ~~and couple the phase-shifted version of the voice call to the second amplifier~~ when required transmit power for the voice call exceeds the threshold.

Claim 20 (Original): The power amplifier/antenna module of claim 19, wherein the coupler circuit includes a 90-degree hybrid coupler that combines the first and second output branches.

Claim 21 (Original): The power amplifier/antenna module of claim 19, wherein the voice call and the phase-shifted voice call are substantially identical except for the phase shift.

Claim 22 (Original): The power amplifier/antenna module of claim 19, wherein the phase shifter phase-shifts the voice call approximately 90 degrees.

Claim 23 (Currently Amended): A digital signal processing module comprising:

a voice call transmission unit to generate a voice call for transmission via a first output branch;

a data call transmission unit to generate a data call for transmission via a second output branch;

a phase shifter to generate a phase-shifted version of the voice call; and

at least one a switch to decouple the data call from the second output branch and couple the phase-shifted version of the voice call to the second output branch when required transmit power for the voice call exceeds ~~a~~ the threshold.

Claim 24 (Original): The digital signal processing module of claim 23, further comprising a power control unit to control the phase shifter and the switch based on required transmit power for the voice call.

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Claim 25 (Original): The digital signal processing module of claim 24, wherein the power control unit monitors power control data, and controls the phase shifter and the switch in response to the power control data.

Claim 26 (Original): The digital signal processing module of claim 25, wherein the power control unit controls the switch to couple the data call to the second amplifier and decouple the voice call from the second amplifier when the required transmit power is less than the threshold.

Claim 27 (Original): The digital signal processing module of claim 23, wherein the voice call and the phase-shifted voice call are substantially identical except for the phase shift.

Claim 28 (Original): The digital signal processing module of claim 23, wherein the phase shifter phase-shifts the voice call approximately 90 degrees.

Claim 29 (Currently Amended): A method comprising:
transmitting a voice call via a first output branch;
transmitting a data call via a second output branch;
combining the first and second output branches for transmission over a wireless interface associated with a mobile wireless communication device; and
decoupling the data call from the second output branch when required transmit power for the voice call exceeds a threshold; and
transmitting the voice call via both the first and second output branches when required transmit power for the voice call exceeds the a threshold.

Claim 30 (Original): The method of claim 29, further comprising phase-shifting the voice call to produce a phase-shifted voice call, wherein transmitting the voice call via both the first and second output branches includes transmitting the voice call via the first output branch and transmitting the phase-shifted voice call via the second output branch.

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Claim 31 (Original): The method of claim 30, wherein the voice call and the phase-shifted voice call are substantially identical except for the phase shift.

Claim 32 (Original): The method of claim 30, wherein phase-shifting the voice call includes phase-shifting the voice call approximately 90 degrees.

Claim 33 (Original): The method of claim 32, further comprising combining the first and second output branches via a 90-degree hybrid coupler.

Claim 34 (Original): The method of claim 29, further comprising:
 monitoring power control data; and
 increasing the transmit power of the voice call in response to the power control data.

Claim 35 (Currently Amended): The method of claim 29, wherein transmitting the voice call via both the first and second output branches includes ~~decoupling the data call from the second output branch and~~ coupling the voice call to the second output branch.

Claim 36 (Original): The method of claim 29, wherein transmitting the voice call via both the first and second output branches includes digitally generating a second voice call substantially identical to the first voice call and coupling the second voice call to the second output branch.

Claim 37 (Original): The method of claim 29, further comprising coupling the data call to the second output branch and decoupling the voice call from the second output branch when the required transmit power is less than the threshold.

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Claim 38 (Currently Amended): The method of claim 29, further comprising:
amplifying the voice call transmitted via the first output branch with a first power amplifier; and
amplifying the voice call transmitted via the second output branch with a second power amplifier,
wherein combining the first and second output branches includes combining the first and second amplified voice calls.

Claim 39 (Original): The method of claim 38, further comprising:
transmitting the voice call at a first carrier frequency; and
transmitting the data call at a second carrier frequency.

Claim 40 (Currently Amended): A mobile wireless communication device comprising:
a first output branch for transmission of a voice call;
a second output branch for transmission of a data call;
a coupler circuit to combine the first and second output branches for transmission over a wireless interface associated with a mobile wireless communication device; and
a power control unit to direct decoupling of the data call from the second output branch and transmission of the voice call via both the first and second output branches when required transmit power for the voice call exceeds a threshold.

Claim 41 (Original): The device of claim 40, further comprising a phase shifter to phase-shift the voice call to produce a phase-shifted voice call, wherein the transmit controller transmits the voice call via the first output branch and transmits the phase-shifted voice call via the second output branch.

Claim 42 (Original): The device of claim 41, wherein the voice call and the phase-shifted voice call are substantially identical except for the phase shift.

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Claim 43 (Original): The device of claim 41, wherein the phase shifter phase-shifts the voice call approximately 90 degrees.

Claim 44 (Original): The device of claim 41, wherein the coupler circuit includes a 90-degree hybrid coupler that combines the first and second output branches.

Claim 45 (Original): The device of claim 40, wherein the power control unit monitors power control data, and increases the transmit power of the voice call in response to the power control data.

Claim 46 (Currently Amended): The device of claim 40, wherein the power control unit directs transmission of the voice call via both the first and second output branches by ~~decoupling the data call from the second output branch~~ and coupling the voice call to the second output branch.

Claim 47 (Original): The device of claim 40, wherein the power control unit directs transmission of the voice call via both the first and second output branches by directing digital generation of a second voice call substantially identical to the first voice call and coupling the second voice call to the second output branch.

Claim 48 (Original): The device of claim 40, wherein the power control unit directs coupling of the data call to the second output branch and decoupling of the voice call from the second output branch when the required transmit power is less than the threshold.

Claim 49 (Original): The device of claim 40, further comprising:
a first power amplifier to amplify the voice call transmitted via the first output branch;
and
a second power amplifier to amplify the voice call transmitted via the second output,
wherein the coupler circuit combines the first and second amplified voice calls.

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Claim 50 (Original): The device of claim 49, further comprising:
a first baseband to radio frequency processor to convert the voice call from a baseband frequency to a first carrier frequency; and
a second baseband to radio frequency processor to convert the data call from a baseband frequency to a second carrier frequency.

Claim 51 (Currently Amended): The device of claim 50, further comprising a phase shifter to phase-shift the voice call to produce a phase-shifted voice call, wherein the transmit controller transmits the voice call via the first output branch and transmits the phase-shifted voice call via the second output branch, and wherein the phase shifter is coupled to the output branch of the first baseband to radio frequency processor.

Claim 52 (Original): A method comprising:
transmitting a voice call at a first transmit carrier frequency via a first output branch;
transmitting a data call at a second transmit carrier frequency via a second output branch;
controlling a transmit power of the voice call in response to power control data; and
dropping the data call and transmitting the voice call via both the first and second output branches at the first transmit carrier frequency when the transmit power of the voice call exceeds a threshold.

Claim 53 (Original): The method of claim 52, further comprising phase-shifting the voice call to produce a phase-shifted voice call, wherein transmitting the voice call via both the first and second output branches includes transmitting the voice call via the first output branch and transmitting the phase-shifted voice call via the second output branch.

Claim 54 (Original): The method of claim 53, wherein phase-shifting the voice call includes phase-shifting the voice call approximately 90 degrees.

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Claim 55 (Original): A mobile wireless communication device comprising:
a first output branch for transmission of a voice call at a first transmit carrier frequency;
a second output branch for transmission of a data call at a second transmit frequency; and
a power control unit to control a transmit power of the voice call in response to power control data, wherein the power control unit drops the data call and directs transmission of the voice call via both the first and second output branches at the first transmit carrier frequency when the transmit power of the voice call exceeds a threshold.

Claim 56 (Original): The device of claim 55, further comprising a phase shifter to phase-shift the voice call to produce a phase-shifted voice call, wherein the transmit controller transmits the voice call via the first output branch and transmits the phase-shifted voice call via the second output branch.

Claim 57 (Original): The device of claim 56, wherein the phase shifter phase-shifts the voice call approximately 90 degrees.

Claim 58 (Currently Amended): A wireless communication device comprising:
means for transmitting a voice call via a first output branch;
means for transmitting a data call via a second output branch;
means for combining the first and second output branches for transmission over a wireless interface associated with a mobile wireless communication device; and
means for decoupling the data call from the second output branch when required transmit power for the voice call exceeds a threshold; and
means for transmitting the voice call via both the first and second output branches when required transmit power for the voice call exceeds the a threshold.

Claim 59 (Original): The device of claim 58, further comprising means for phase-shifting the voice call to produce a phase-shifted voice call, wherein the means for transmitting the voice call via both the first and second output branches includes means for transmitting the voice call via the first output branch and transmitting the phase-shifted voice call via the second output branch.

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Claim 60 (Original): The device of claim 59, wherein the voice call and the phase-shifted voice call are substantially identical except for the phase shift.

Claim 61 (Original): The device of claim 59, wherein the phase-shifting means phase-shifts the voice call approximately 90 degrees.

Claim 62 (Original): The device of claim 61, further a 90-degree hybrid coupler for combining the first and second output branches.

Claim 63 (Original): The device of claim 58, wherein the voice call has a first carrier frequency, and the data call has a second carrier frequency different from the first carrier frequency.

Claim 64 (Currently Amended): A power amplifier module comprising:
a first amplifier to amplify a voice call for transmission over a first output branch;
a second amplifier to amplify a data call for transmission over a second output branch;
a first hybrid coupler to pass the voice call to the first amplifier and generate a phase-shifted version of the voice call;
at least one a switch device to couple the phase-shifted version of the voice call to the second amplifier, and decouple the data call from the second amplifier when required transmit power for the voice call exceeds a threshold; and
a second hybrid coupler to combine the first and second output branches for transmission over a wireless interface associated with a mobile wireless communication device.

Claim 65 (Original): The power amplifier module of claim 64, wherein the first hybrid coupler includes a 90-degree hybrid coupler, and the second hybrid coupler includes a 90-degree hybrid coupler.

Claim 66 (Original): The power amplifier module of claim 64, further comprising a power control unit to control the switch device based on required transmit power for the voice call.

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Claim 67 (Original): The power amplifier module of claim 66, wherein the power control unit monitors power control data, and controls the switch device in response to the power control data.

Claim 68 (Original): The power amplifier module of claim 66, wherein the power control unit controls the switch device to couple the data call to the second amplifier when the required transmit power is less than the threshold.